

THE LEADER IN ENVIRONMENTAL TESTING

# **ANALYTICAL REPORT**

TestAmerica Laboratories, Inc.

TestAmerica Seattle 5755 8th Street East Tacoma, WA 98424 Tel: (253)922-2310

TestAmerica Job ID: 580-79723-1

Client Project/Site: Portland Harbor Pre-Remedial Design

For:

AECOM 1111 Third Ave Suite 1600 Seattle, Washington 98101

Attn: Amy Dahl

# M. Elains Walker

Authorized for release by: 9/5/2018 12:33:19 PM

Elaine Walker, Project Manager II (253)248-4972

elaine.walker@testamericainc.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: AECOM

TestAmerica Job ID: 580-79723-1 Project/Site: Portland Harbor Pre-Remedial Design

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#### **Case Narrative**

Client: AECOM TestAmerica Job ID: 580-79723-1

Project/Site: Portland Harbor Pre-Remedial Design

Job ID: 580-79723-1

**Laboratory: TestAmerica Seattle** 

Narrative

# CASE NARRATIVE Client: AECOM

Project: Portland Harbor Pre-Remedial Design Report Number: 580-79723-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

#### **RECEIPT**

One sample was received on 8/20/2018 3:10 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.1° C.

This report contains results of all analyses performed by TestAmerica Seattle.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

#### **DIESEL AND MOTOR OIL RANGE ORGANICS**

Sample PDI-RB-VV-180818 (580-79723-1) was analyzed for diesel and motor oil range organics in accordance with Method NWTPH-Dx. The sample was prepared on 08/26/2018 and analyzed on 08/27/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **METALS (ICPMS)**

Sample PDI-RB-VV-180818 (580-79723-1) was analyzed for Metals (ICPMS) in accordance with 6020A\_LL. The sample was prepared on 08/22/2018 and analyzed on 08/23/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **TOTAL MERCURY**

Sample PDI-RB-VV-180818 (580-79723-1) was analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The sample was prepared on 08/22/2018 and analyzed on 08/23/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **TOTAL ORGANIC CARBON**

Sample PDI-RB-VV-180818 (580-79723-1) was analyzed for total organic carbon in accordance with SM 5310B. The sample was analyzed on 08/22/2018.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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TestAmerica Seattle 9/5/2018

## **Definitions/Glossary**

Client: AECOM TestAmerica Job ID: 580-79723-1

Project/Site: Portland Harbor Pre-Remedial Design

### **Qualifiers**

#### **General Chemistry**

J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

## **Glossary**

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC:	Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MDA Minimum Detectable Activity (Radiochemistry)
MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)
NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

TestAmerica Seattle

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## **Client Sample Results**

Client: AECOM Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79723-1

Client Sample ID: PDI-RB-VV-180818

Lab Sample ID: 580-79723-1

**Matrix: Water** 

Date	Collected: 08/18/18 16:30	
Date	Received: 08/20/18 15:10	

Method: NWTPH-Dx - No Analyte		olatile Pet Qualifier	roleum Pro	•	C) Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND	Qualifier	0.11	0.065	mg/L		08/26/18 14:00	08/27/18 21:54	1
Motor Oil (>C24-C36)	ND		0.35	0.096	J		08/26/18 14:00	08/27/18 21:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	69	-	50 - 150				08/26/18 14:00	08/27/18 21:54	1
Analyte Arsenic	Result	Qualifier	RL 0.0010		Unit ma/L	D	Prepared 08/22/18 13:14	Analyzed 08/23/18 13:48	Dil Fac
Method: 6020B - Metals									
	• • •		0.0010	0.00020	J				1
Cadmium	ND		0.00040	0.00010	•		08/22/18 13:14	08/23/18 13:48	1
Copper	0.011		0.0020	0.00060			08/22/18 13:14	08/23/18 13:48	
Lead	ND		0.00080	0.00020	mg/L		08/22/18 13:14	08/23/18 13:48	1
Zinc	ND		0.0070	0.0019	mg/L		08/22/18 13:14	08/23/18 13:48	1
Method: 7470A - Mercur	ry (CVAA)								
Analyte	• •	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		08/22/18 18:46	08/23/18 13:12	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.23	J	1.0	0.19	mg/L			08/22/18 14:18	1

9/5/2018

TestAmerica Job ID: 580-79723-1

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Type: Total/NA

Project/Site: Portland Harbor Pre-Remedial Design

## Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-282502/1-A **Matrix: Water** 

**Analysis Batch: 282534** 

Client: AECOM

**Prep Batch: 282502** MB MB Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac #2 Diesel (C10-C24)  $\overline{\mathsf{ND}}$ 0.11 0.065 mg/L 08/26/18 14:00 08/27/18 18:09 Motor Oil (>C24-C36) ND 0.35 0.096 mg/L 08/26/18 14:00 08/27/18 18:09

MB MB

Qualifier Limits Dil Fac Surrogate %Recovery Prepared Analyzed 08/26/18 14:00 08/27/18 18:09 o-Terphenyl 80 50 - 150

Lab Sample ID: LCS 580-282502/2-A

**Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA Analysis Batch: 282534 **Prep Batch: 282502** LCS LCS Spike %Rec.

Result Qualifier Limits **Analyte** Added Unit D %Rec #2 Diesel (C10-C24) 2.00 1.49 mg/L 75 50 - 120 Motor Oil (>C24-C36) 2.00 1.74 87 64 - 120 mg/L

LCS LCS

Surrogate %Recovery Qualifier Limits o-Terphenyl 50 - 150 83

Lab Sample ID: LCSD 580-282502/3-A

**Matrix: Water** 

**Analysis Batch: 282534** Prep Batch: 282502 LCSD LCSD Spike %Rec. **RPD** Analyte Added Result Qualifier Unit %Rec Limits **RPD** Limit #2 Diesel (C10-C24) 2.00 1.50 mg/L 75 50 - 120 26 2.00 64 - 120 Motor Oil (>C24-C36) 1.77 mg/L 88 2 24

LCSD LCSD

Surrogate %Recovery Qualifier Limits o-Terphenyl 82 50 - 150

#### Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 580-282187/21-A

**Matrix: Water** 

**Analysis Batch: 282351** 

**Client Sample ID: Method Blank Prep Type: Total Recoverable** Prep Batch: 282187

**Client Sample ID: Lab Control Sample Dup** 

	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00020	mg/L		08/22/18 13:14	08/23/18 13:35	1
Cadmium	ND		0.00040	0.00010	mg/L		08/22/18 13:14	08/23/18 13:35	1
Copper	ND		0.0020	0.00060	mg/L		08/22/18 13:14	08/23/18 13:35	1
Lead	ND		0.00080	0.00020	mg/L		08/22/18 13:14	08/23/18 13:35	1
Zinc	ND		0.0070	0.0019	mg/L		08/22/18 13:14	08/23/18 13:35	1

Lab Sample ID: LCS 580-282187/22-A

Arsenic

**Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Total Recoverable Analysis Batch: 282351 Prep Batch: 282187** LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit %Rec Limits

4.03

4.00

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101

80 - 120

mg/L

TestAmerica Job ID: 580-79723-1

Project/Site: Portland Harbor Pre-Remedial Design

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 580-282187/22-A			Client Sample ID: Lab Control Sample
Matrix: Water			Prep Type: Total Recoverable
Analysis Batch: 282351			Prep Batch: 282187
•	Snike	LCS LCS	%Rec

		Spike	LCS LCS			%Rec.	
	Analyte	Added	Result Qualifier	Unit	D %Rec	Limits	
	Cadmium	0.100	0.108	mg/L	108	80 - 120	
	Copper	0.500	0.496	mg/L	99	80 - 120	
İ	Lead	1.00	1.01	mg/L	101	80 - 120	
	Zinc	4.00	3.98	mg/L	100	80 - 120	

Lab Sample ID: LCSD 580-282187/23-A **Client Sample ID: Lab Control Sample Dup Matrix: Water Prep Type: Total Recoverable Analysis Batch: 282351 Prep Batch: 282187** LCSD LCSD Spike %Rec. **RPD** Analyte Added Result Qualifier Unit Limits RPD Limit %Rec Arsenic 4.00 4.09 102 80 - 120 20 mg/L Cadmium 0.100 0.107 mg/L 107 80 - 120 20 Copper 0.500 0.496 mg/L 99 80 - 120 20 1.00 20 Lead 1.01 mg/L 101 80 - 120 0

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 580-282235/21-A Client Sample ID: Method Blank

4.02

mg/L

101

80 - 120

Prep Type: Total/NA

Prep Batch: 282235

4.00

Matrix: Water

Zinc

Client: AECOM

Analysis Batch: 282350

 MB MB

 Analyte
 Result Mercury
 Qualifier
 RL ND
 MDL Unit MDL Unit MDL MIT MDL

Lab Sample ID: LCS 580-282235/22-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA **Analysis Batch: 282350** Prep Batch: 282235 LCS LCS Spike %Rec. Analyte Added Result Qualifier %Rec Limits Mercury 0.00200 0.00220 110 80 - 120 mg/L

Lab Sample ID: LCSD 580-282235/23-A Client Sample ID: Lab Control Sample Dup **Matrix: Water** Prep Type: Total/NA **Analysis Batch: 282350** Prep Batch: 282235 LCSD LCSD Spike %Rec. **RPD** Analyte Added Result Qualifier Unit %Rec Limits RPD Limit 0.00200 80 - 120 0.00211 Mercury mg/L 106 20

Method: SM 5310B - Organic Carbon, Total (TOC)

Lab Sample ID: MB 580-282342/22 Client Sample ID: Method Blank
Matrix: Water Prep Type: Total/NA

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**Analysis Batch: 282342** 

	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.0	0.19	mg/L			08/22/18 14:18	1

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# **QC Sample Results**

Client: AECOM TestAmerica Job ID: 580-79723-1

Project/Site: Portland Harbor Pre-Remedial Design

Method: SM 5310B - Organic Carbon, Total (TOC) (Continued)

Lab Sample ID: LCS 580-282342/23 **Matrix: Water** 

Analysis Batch: 282342

Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit D %Rec Limits Total Organic Carbon 10.0 10.3 103 85 - 115 mg/L

**Prep Type: Total/NA** 

**Client Sample ID: Lab Control Sample** 

## **Lab Chronicle**

Client: AECOM TestAmerica Job ID: 580-79723-1

Project/Site: Portland Harbor Pre-Remedial Design

Client Sample ID: PDI-RB-VV-180818 Lab Sample ID: 580-79723-1

Date Collected: 08/18/18 16:30 Matrix: Water

Date Received: 08/20/18 15:10

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			282502	08/26/18 14:00	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	282534	08/27/18 21:54	CJ	TAL SEA
Total Recoverable	Prep	3005A			282187	08/22/18 13:14	T1H	TAL SEA
Total Recoverable	Analysis	6020B		1	282351	08/23/18 13:48	FCW	TAL SEA
Total/NA	Prep	7470A			282235	08/22/18 18:46	T1H	TAL SEA
Total/NA	Analysis	7470A		1	282350	08/23/18 13:12	FCW	TAL SEA
Total/NA	Analysis	SM 5310B		1	282342	08/22/18 14:18	TTN	TAL SEA

#### **Laboratory References:**

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

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## **Accreditation/Certification Summary**

Client: AECOM TestAmerica Job ID: 580-79723-1

Project/Site: Portland Harbor Pre-Remedial Design

## **Laboratory: TestAmerica Seattle**

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	<b>EPA Region</b>	<b>Identification Number</b>	<b>Expiration Date</b>
Alaska (UST)	State Program	10	17-024	01-19-19
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	07-31-19
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-19

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# **Sample Summary**

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79723-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79723-1	PDI-RB-VV-180818	Water	08/18/18 16:30	08/20/18 15:10

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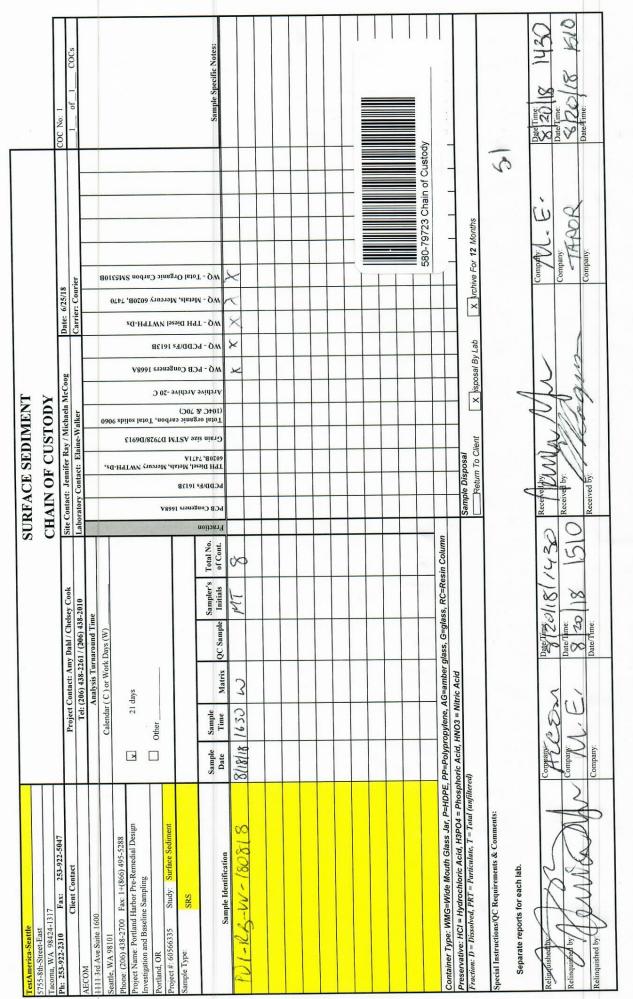
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	Sample	Sample			Sampler's	Total No.	Frection	PCB Cong	PCDD/Fs	H Diese 08, 747	ein siz	alorg 4C &	hive /	>- PC	) . PC	7. TP	) - Me	}-Tet							
Sample Identification	Date	Time	Matrix	QC Sample	Initials	of Cont.	JÆ	<u> </u>	1 2	1.P.	త్	To (10	γv	š	ž	ž	ž	š						Sample Specific Note	es:
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action: D = Dissolved, PRT = Particulate, T = Total (unfiltered	4)								le Dist		_4		٦				<b></b>	p.							
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SURFACE SEDIMENT

**CHAIN OF CUSTODY** 

TestAmerica-Seattle

5755-8th-Street-East Tacoma, WA 98424-1317

Ph: 253-922-2310

Fax: 253-922-5047

Client: AECOM Job Number: 580-79723-1

Login Number: 79723 List Source: TestAmerica Seattle

List Number: 1

Creator: Antonson, Angeline D

Creator. An	tonson, Angeline D		
Question		Answer	Comment
Radioactivity meter.	wasn't checked or is = background as measured by a survey</td <td>True</td> <td></td>	True	
The cooler's	custody seal, if present, is intact.	True	
Sample cust	ody seals, if present, are intact.	True	
The cooler o tampered wi	r samples do not appear to have been compromised or th.	True	
Samples we	re received on ice.	True	
Cooler Temp	perature is acceptable.	True	
Cooler Temp	perature is recorded.	True	
COC is pres	ent.	True	
COC is filled	out in ink and legible.	True	
COC is filled	out with all pertinent information.	True	
Is the Field S	Sampler's name present on COC?	True	
There are no	discrepancies between the containers received and the COC.	True	
Samples are HTs)	received within Holding Time (excluding tests with immediate	True	
Sample cont	ainers have legible labels.	True	
Containers a	re not broken or leaking.	True	
Sample colle	ection date/times are provided.	True	
Appropriate	sample containers are used.	True	
Sample bottl	es are completely filled.	True	
Sample Pres	servation Verified.	True	
There is suff MS/MSDs	icient vol. for all requested analyses, incl. any requested	True	
Containers re <6mm (1/4")	equiring zero headspace have no headspace or bubble is .	True	
Multiphasic s	samples are not present.	True	
Samples do	not require splitting or compositing.	True	
Residual Ch	lorine Checked.	N/A	

**TestAmerica Seattle**